

*Monthly Mean Temperatures at Special Points* have been as follows: Mt. Washington, 42°.4, Pike's Peak, 30°9.

*Maximum and Minimum Temperatures.*—Maximum temperature, at Signal Service stations, above 95°, are reported as follows: 96° at Savannah, Jacksonville, Vicksburg, Indianola, Boerne, Castroville,; 97° at Montgomery, Salinas City, Cal.; 98° at Shreveport, Fort Sill, Sacramento; 99° Denison, Fort Griffin; 100° Brackettville, Corsicana, San Antonio, Campo; 101° Cambridge, Visalia; 102° Eagle Pass; 103° Laredo; 104° Phoenix, Uvalde; 106° Red Bluff; 107° Maricopa Wells; 108° Fresno, Wickenburg; 112° Fort Yuma. From stations other than those of the Signal Service, *maximum temperatures* have also been reported as follows: 96° Ft. Hayes, Kan. Hennepin, Ill.; 98° Clarksville, Tex.; 99° Baton Rouge, La.; Ft. Richardson, Tex., Camp Sheridan, Neb. 100°, Ft. McPherson, Neb. 101°, Ft. McKavett, Tex. 102° Ft. Rice, Dak.; Ft. Griffin, Tex.; Ft. Clark, Tex.

*Minimum temperatures* below 35°: 34°, Breckenridge, Minn., Umatilla; 33°, Bismarck, and Lower Brule Agency, Dak., Hayes' City, Kan.; 32°, Winnemucca, Neb., Woodstock, Vt.; 30°, Ft. Abercrombie, Dak., Pembina; 29°, Ft. Randall, Dak., Orono, Me.; 28°, Nile, N. Y.; 27°, Cheyenne, Wv., Sydney B'ks, Neb.; 26°, Summit, Col.; 25°, Neillsville, Wis.; 23°, Ft. Pembina, Dak.; 21°, Coalville, Utah; 20°, Mt. Washington, N. H.; 11°, Pike's Peak, Col.

The maximum temperatures of the month may be divided into three periods, the first of which occurred from the 1st to 3d in the West Gulf, South and Middle Atlantic States; the second from the 10th to 16th gradually extending from Colorado, Nebraska and Minnesota over the Mississippi valley as far south as Alabama, and thence over the Lake region, New York and New England; and the third on the 30th extending from Lakes Michigan and Huron southward to the Ohio valley.

The minimum temperatures occurred, almost without exception, from the 17th to the 23d, attending the advance of area of high pressure No. III, first from Utah to Iowa and northward, gradually extending thence to the Atlantic coast.

*Ranges of Temperature.*—The large monthly or diurnal ranges have been respectively as follows: Bismarck, monthly, 49°, diurnal 46°; Pembina, 59° and 47°; Breckenridge, 58° and 44°; Winnemucca, 57° and 50°; Umatilla, 61° and 39°; Campo, 69° and 56°; Fort Griffin, 49° and 44°; Cheyenne, 56° and 43°; North Platte, 55° and 45°; Denver, 55° and 45°; Visalia, 55° and 42°; Red Bluff, 54° and 36°; Marquette, 52° and 35°; St. Paul, 52° and 32°; Yankton, 51° and 42°. The least monthly and diurnal ranges have been, respectively, as follows: Cape Hatteras, monthly, 20°, diurnal 11°; St. Marks, 27° and 22°; New Orleans, 29° and 15°; Charleston, 29° and 17°; Jacksonville, 29° and 27°; Punta Russa, 20° and 17°; Key West, 22° and 13°; Cape Henry, 22° and 1°.

*Frosts*, were experienced as follows.—From the 1st, to the 4th, in Iowa, Wis., Ill., Ind. Mich., Ohio, N. Y., and on Mount Washington; on the 5th and 6th, near Lake Superior; on the 7th and 8th on Mount Washington and in northern Maine; on the 8th and 9th, Utah and Col.; from the 17th to 23rd, the first general extensive frost of the season was experienced, being felt first in Utah and Col., and extending thence eastward over the entire country north of the 37th degree of latitude, to the Middle Atlantic and New England coast. Slight damage was reported to vegetation in Col., Dak., Ind., Iowa, Mass. Wis.

*Ice*—was reported on the 1st and 2nd at Detroit; from the 8th to the 10th at Coalville, Utah; 17th, Virginia City, one-eighth of an inch thick; on the 18th, one-sixteenth of an inch at Cresco, Iowa, and Embarrass, Wis.; on the 22nd, ice at Strafford, Vt.

## PRECIPITATION.

*In General.*—The general distribution of rain for the month is shown on chart No. III. The table in the lower left-hand corner gives the average precipitation in the various districts. This table shows a large excess in the Gulf, South and Middle Atlantic coast States, and in Tennessee and Minnesota, and deficiencies from New England westward over the Lake region and Ohio valley to the Upper Mississippi and Missouri valleys. This is almost the reverse of the report for August, and is due mostly to the heavy rain-falls attending the storms Nos. II, VI and XI, shown on chart No. I. As was the case in August, considerably over the average amount has also fallen this month in Oregon, while in California no rain has been reported.

*Special Heavy Rains.*—The following are the most notable cases of heavy rains that have been reported: 1st—Wilmington, N. C., (1st and 2d,) 5.02 inches; Jacksonville, Fla., 2.00 in.; Anna, Ill., 2.62 in.; Brownsville, Mo., 2.25. 2nd—Cheyenne, Wv. Ter., 1.07 in.; Melissa, Tex., (2nd to 4th,) 3.00 in.; Coleman City, Tex., 2.45 in.; Concho, Tex., 1.34 in. 3rd—Shreveport, La., (3rd, 4th and 5th,) 8.59 in.; 6 inches in 8 hours on the 4th; Fort Griffin, (3rd and 4th,) 2.51 in.; Cambridge, Tex., (3rd and 4th,) 2.12 in. 4th—Fayette, Miss., 2.10 in.; Coleman City, Tex., Miss., 1.79 in.; Stockton, Tex., 1.94 in.; Concho, Tex., (4th and 5th,) 2.02 in. 5th—Pilot Point, Tex., 3.87 in.; Boerne, Tex., 1.84 in.; Coleman City, Tex., 2.16 in. 6th—Galveston,

Tex., 4.83 in.; Indianola, Tex., 1.62 in.; Green Spring, Ala., 2.08 in.; Milford, Del., (6th to 8th,) 5.70 in.; Dover, Del., (6th to 8th,) 3.80 in.; Vineland, N. J., (6th to 8th,) 3.71 in.; Reading, Penn., (6th to 8th,) 3.34 in. 7th—Atlantic City, N. J., (7th and 8th,) 2.00 in.; Norfolk, Va., 2.24 in.; Sandy Hook, N. J., 1.63 in.; Cape May, N. J., (7th and 8th,) 4.71 in.; Barnegat, N. J., 1.74 in.; Cape Lookout, N. C., 1.87 in. 8th—Cambridge, Tex., 1.01 in.; North Platte, Neb., 2.52 in.; Mt. Ida, Ark., (8th and 9th,) 4.00 in.; Fort Wayne, Ind., (8th and 9th,) 3.50 in.; Norfolk, Neb., (8th and 9th,) 1.96 in.; Nile, N. Y., 1.70 in.; Accotink, Va., 2.10 in. 9th—Leavenworth, Kan., 1.24 in.; Green Spring, Ala., (9th and 10th,) 2.23 in.; Quitman, Ga., 2.02 in.; Kansas City, Mo., 2.28 in.; St. Joseph, Mo., 4.80 in.; Lexington, Mo., 1.80 in. 10th—Knoxville, Tenn., 2.27 in.; Savannah, Ga., (10th–11th,) 2.00 in.; Baton Rouge, La., 4.85 in. 11th—Wilmington, N. C., 2.00 in.; Brackettville, Tex., 1.42 in. 12th—Wilmington, N. C., 3.05 in.; Accotink, Va., 2.50 in. 13th—Charleston, S. C., 3.00 in.: 2.00 inches in 30 minutes; Keokuk, Iowa, 1.58 in. 14th—Savannah, Ga., 2.21 in.; Fort Sill, Ind. Ter., 1.19 in.; Fort Snelling, Minn., 1.74 in. 15th—Norfolk, Va., 2.15 inches in 3 hours; San Antonio, Tex., 1.76 in. 16th—Galveston, Tex., (16th and 17th,) 8.70 in. 17th—Knoxville, Tenn., 1.81 in.; Nashville, Tenn., 2.93 in.; Fort Sill, Ind. Ter., 2.08 in.; Baton Rouge, La., (17th, 18th and 19th,) 12.45 in.; S. Orange, N. J., 1.68 in.; Brookhaven, Miss., (17th to 20th,) 7.30 inches in 56 hours. 18th—Mobile, Ala., (18th and 19th,) 8.07 in.: 6.75 in 10 hours; New Orleans, La., (18th and 19th,) 8.40 in.; Carlowville, Ala., (18th, 19th and 20th,) 10.42 in.; Green Spring, Ala., (18th to 20th,) 8.20 in.; Fayette, Miss., (18th and 19th,) 6.20 in. 19th—St. Marks, Fla., 2.26 in. 20th—Tybee Island, Ga., 2.61 in.; Cape Hatteras, N. C., 3.10 in.; Cape Henry, Va., 2.31 in.; Kittyhawk, N. C., 2.65 in. 23rd—Tybee Island, Ga., 2.20 in. 25th—Smithville, N. C., 2.33 in.; North Platte, Neb., 1.93 in. 26th—Peoria, Ill., 2.01 in. 27th—Wilmington, N. C., 3.98 in.; Smithville, N. C., (27th and 28th,) 3.55 in.; Greenville, N. C., (27th to 29th,) 8.30 in.; Chattanooga, Tenn., 2.75 in. 28th—Norfolk, Va., 2.07 in.; Wilmington, N. C., 2.83 in.; Cape Hatteras, N. C., (28th and 29th,) 8.13 in.; Weldon, N. C., 2.06 in.; Capeville, Va., 2.00 in.; Cape Lookout, N. C., (27th, 28th and 29th,) 8.96; Cape Henry, Va., (28th and 29th,) 3.54 in.; Kittyhawk, N. C., (28th and 29th,) 7.25 in.

*Small Monthly Rain-falls.*—The following stations report small monthly rain falls: San Francisco, Red Bluff, Sacramento, Visalia, Fresno, Salinas City, Los Angeles, San Diego and Campo, in California; Winnemucca, in Nevada; and Yuma, Arizona, report no rain-fall; Umatilla, Or., 0.59 in.; Denver, Col., 0.38 in.; Bismarck, Dak., 0.11 in.; Dubuque, Iowa, 0.67 in.; Port Huron, Mich., 0.28 in.; Port Stanley, Port Dover and Toronto, Can., respectively, 0.58, 0.98 and 0.42 in.; throughout Massachusetts and Rhode Island the rain-fall averaged only about half an inch; and in Texas, Brownsville reports 0.69; Rio Grande, 0.10; Laredo, 0.59; Castroville, 0.02; and Mason, 0.29.

*Large Monthly Rain-falls.*—Monthly rain-falls of seven inches or more, are reported as follows: Galveston and Coleman City, Tex., respectively, 13.85 and 7.08 inches; Shreveport, Baton Rouge and New Orleans, La., respectively, 9.93, 18.42 and 13.21 in.; Fayette, Miss., 11.20 in.; Green Spring, Carlowville and Mobile, Ala., respectively, 14.11, 12.43 and 12.62 in.; Mayport, Fla., 8.30 in.; Savannah and Thatcher's Island, Ga., respectively, 8.92 and 11.24 in.; in North Carolina, Wilmington reports 20.10 in.; Smithville, 11.9 in.; Cape Lookout, 16.32 in.; Cape Hatteras, 15.41 in.; Kittyhawk, 13.39 in.; Goldsboro', 16.70 in.; Weldon, 8.08; and Greenville, 16.46 in., Norfolk, Cape Henry, Fort Monroe and Hampton, Va., respectively, 11.90, 10.04, 8.14 and 7.53 in.; Cape May, N. J., 7.22 in.

*Droughts.*—Extensive droughts have prevailed during the month over New England and eastern New York, Indiana, Ohio, southern portions of Michigan, Wisconsin, eastern Iowa and northern portion of Illinois, and numerous reports of dry springs and injury to vegetation have been received from those districts.

*Floods.*—Destructive floods attended the storm No. VI, on chart No. I, at Indianola from the 14th to the 17th; at Galveston on the 17th and 18th; at New Orleans on the 18th; and the 19th and 20th in the valleys of the Black Warrior and Alabama rivers, Alabama. In the last-named districts the crops of cotton, corn and fodder were entirely swept away. It is estimated that 30,000 bales of cotton were destroyed.

*Hail.*—Hail has been reported as follows: 1st, Pike's Peak, Col. 2nd, Adam's, N. Y.; Pike's Peak, Col. 4th, Lower Brule Agency, Dak.; Fort Union, N. Mex.; Pike's Peak, Col. 5th, four miles northeast of Fort Union, N. M., (severe.) 14th, Portland, Or. 15th, Fort Pembina, Dak., and Virginia City, Mont. 19th, Wytheville, Va.; Alpena, Mich. 21st, Gardiner, Me.; Somerset, Mass.; Fort Wingate, N. Mex. 23rd, Camp Brown, Wyo. 25th, Emerson and North Platte, Neb. 27th, Breckenridge, Minn. 30th, Marquette, Mich.

*Snow.*—On the 7th, 12th and 27th snow-squalls were reported at Virginia City, Mont., and on the 12th at Austin, Eureka and other places in Nevada. At Summit, Col., 11½ inches of snow fell in six days, and snow was also reported on Pike's Peak on seven days, but had all melted before the end of month. On the 14th snow fell on Baldy Mountain, N. M.; on the 3d the first snow-fall of the season occurred on Mt. Washington, N. H., and on the 21st a furious snow-storm occurred there.

*Rainy Days.*—The number of days on which rain has fallen, as recorded by Signal Service observers, ranges as follows: New England, 13 to 12; Middle Atlantic States, 4 to 19; South Atlantic States, 5 to 19; East Gulf States, 11 to 15; West Gulf States, 6 to 14; Tennessee and Ohio valley, 7 to 13; Missouri valley, 5 to 8; Upper Mississippi valley, 6 to 11; Upper Lake region, 8 to 14; Lower Lake region, 8 to 13; Rocky Mountain stations, 0 to 13; California, 0; Oregon, 11.

*Cloudy Days.*—The number of "cloudy" days reported during the month by Voluntary Observers and Army Surgeons, ranges about as follows: New England, 0 to 7; Middle Atlantic States, 0 to 16; South Atlantic States, 4 to 16; East Gulf States, 7 to 13; West Gulf States, 3 to 8; Tennessee and Ohio valley, 1 to 9; Lower Missouri valley, 0 to 7; Upper Mississippi valley, 1 to 8; Lake region, 0 to 12; Rocky Mountain stations, 0 to 5; California, 0 to 4.

## RELATIVE HUMIDITY.

The average relative humidity for the month ranges about as follows: New England, 67 to 81; Middle Atlantic States, 67 to 81; South Atlantic States, 71 to 82; East Gulf States, 71 to 82; West Gulf States, 65 to 76; Tennessee and Ohio valley, 66 to 78; Lower Missouri valley, 65 to 69; Upper Mississippi valley, 65 to 67; Upper Lakes, 61 to 74; Lower Lakes, 68 to 75; California, 43 to 71; Oregon, 48 to 76.

High stations not corrected for elevation report as follows: Pike's Peak, 61; Mt. Washington, 72; North Platte, 53; Cheyenne, 42; Denver, 36; Santa Fe, 34; Salt Lake City, 31.

## WINDS.

*In General.*—The prevailing winds at Signal Service stations are shown by arrows on Chart No. II, from which it will be seen that the winds were northeasterly from Virginia southeastward to Florida; east along the immediate east Gulf coast; south and southeast from Texas northward to Minnesota; south or southwest in the Lake region; southwest along the New England coast, and from southwest to southeast in the Middle Atlantic States.

*Total Movements.*—The largest total movements have been as follows: Stockton, Tex., 15,789 miles; Pike's Peak, 13,471 miles; Cape Lookout, 11,648; Kittyhawk, 11,064; Cape Hatteras, 9,625; Cape Henry, 9,542; Tybee Island, 9,513; North Platte, 9,510; Dodge City, 9,064. The smallest movements have been as follows: Salt Lake City, 1,534; Lynchburg, 1,810; Visalia, 1,879; Nashville, 1,950; Indianapolis, 2,752; Cincinnati, 2,858; Knoxville, 2,971; Portland, Or., 2,852.

*The highest velocities*, in miles per hour, have been as follows: 3rd, Mt. Washington, NW., 60; 7th, North Platte, W., 72, and Barneget, E., 60; 8th, Dodge City, NW., 50; 14th, La Crosse, NW., 60; 16th and 21st, Pike's Peak, W., 56; 17th, Galveston, NE., 60, and Indianola, S., 72; 18th, New Orleans, NE., 39; 19th, Mobile, SE., 35; 21st, Mt. Washington, NW., 72; 22nd, Bismarck, N., 72, and Tybee Island, NE., 60; 27th, Cape Lookout, SE., 78; 28th, Cape Hatteras, NE., 48, and Cape Lookout, S., 80; 29th, Cape Lookout, NE. 86; 30th, Bismarck, —, 72.

*Local storms, tornadoes, &c.*, have been reported as follows, (unless specially noted, it is understood that the following list of high winds includes only local storms, and not such gales as prevailed simultaneously over a large region:) 1st, Maysville, Ky., a tornado of terrific violence and short duration, unroofing buildings and damaging shipping to a considerable extent. 2nd, Coleman City, Texas, violent storm, with heavy rain. 3rd, Yuma, Arz., terrific sand-storm, during which a large whirlwind passed up north side of Colorado river. 5th, heavy rain and wind-storm at New Orleans, doing considerable damage to shipping on north side of river. 11th, Coleman City, Texas, sand-storm, estimated velocity of wind 40 miles per hour. 12th, Colorado Desert, Cal., during a heavy thunder-storm between Pilot Knob and Cactus a water-spout burst, destroying four hundred feet of railroad track. 14th, La Crosse, Wis., northwest gale, doing damage to buildings.

## VERIFICATIONS.

*Indications.*—The detailed comparison of the tri-daily weather indications, with the telegraphic reports for the succeeding twenty-four hours, shows a general percentage of omissions of 0.4 per cent., and of verifications of 85.5 per cent. The percentages of verifications for the four elements have been: weather, 88.6; wind, 83.7; temperature, 88.5; barometer, 81.0. The percentages of verifications by geographical districts have been: New England, 83.0; Middle Atlantic States, 85.5; South Atlantic States, 86.7; East Gulf States, 84.2; West Gulf States, 87.2; Lower Lake region, 86.2; Upper Lake region, 85.9; Tennessee and Ohio valley, 83.1; Upper Mississippi valley, 88.0; Lower Missouri valley, 85.0. Of the 3,588 predictions that have been made, 116, or 3.1 per cent., are considered to have entirely failed; 109, or 3.0 per cent., were one-fourth verified; 422, or 11.8 per cent., were half verified; 444, or 12.4 per cent., were three-fourths verified; 2,497, or 69.6 per cent., were fully verified, so far as can be judged from our weather maps.